ABSTRACT OF THE DISCLOSURE

The current invention features methods for reliably and controllably separating immunoglobulin half antibodies from immunoglobulin whole antibodies, as well as purified immunoglobulin half antibody preparations and purified immunoglobulin whole antibody preparations while preserving biological activity. These dissociated half antibodies can be chromatographically separated from whole antibodies. There are four known subclasses of IgG molecules: IgG_1; IgG_2; IgG_3; and IgG_4. IgG_4 molecules differ from the other IgG isotypes in that the disulfide bonds that link the two heavy chain subunits together do not always form. Due to the non-covalent interactions that hold the heavy chain subunits together, the heterogeneity of IgG_4 molecules is not apparent following gel filtration of purified IgG_4 protein. However, when purified IgG_4 protein is separated by denaturing polyacrylamide gel electrophoresis (SDS-PAGE) under non-reducing conditions, two distinct protein species can be identified – whole antibody and "half-antibodies."